

Claims

1. A separation device comprising in the direction of feed flow:

a feed channel including a shear region having a length;

5 no more than one permeate passage operatively associated with the shear region of the feed channel, the permeate passage extending generally perpendicular to the direction of feed flow and having a width in the direction of feed flow which is less than the length of the shear region of the feed channel; and

10 a porous medium positioned between the shear region of the feed channel and the permeate passage.

2. A separation device comprising:

a feed channel including a shear region;

15 a plurality of permeate passages operatively associated with the shear region of the feed channel, the plurality of permeate passages including at least first and second permeate passages isolated from one another; and

20 a porous medium positioned between the shear region of the feed channel and the permeate passages.

3. A separation device comprising:

a feed channel including a shear region;

a plurality of permeate passages operatively associated with

the shear region of the feed channel;

at least first and second flow/pressure control devices, each control device being arranged to control permeate flow or pressure within at least one permeate passage independently of the flow or pressure within another permeate passage; and

a porous medium positioned between the shear region of the feed chamber and the permeate passages.

4. A separation device comprising:

a feed channel including a shear region;

no more than one permeate passage operatively associated with the shear region of the feed channel, the permeate passage extending generally perpendicular to the direction of feed flow in the feed channel and having a width in the direction of feed flow of less than about 20 mm; and

a porous medium positioned between the shear region of the feed channel and the permeate passage.

5. A separation process comprising:

generating a shear layer in a feed fluid; and

passing permeate from the shear layer into a first permeate passage and passing permeate from the shear layer into a second permeate passage isolated from the first permeate passage.

6. A separation process comprising:

generating a shear layer in a feed fluid;

passing permeate from the shear layer into first and second
permeate passages; and

5 controlling the permeate flow/pressure in the first and second
permeate passages independently of one another.

7. A separation process comprising:

generating a shear layer in a shear region at a porous

10 medium; and

independently controlling TMP incrementally along the length
of the shear region.